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07 December 2017

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street SW
Washington DC 20554

**Re: Restoring Internet Freedom, WC Docket No. 17-108**

On Tuesday, 05 December, Anthony M. Rutkowski, Netmagic Associates CEO, conveyed the attached published article by email to Chairman staff members Matthew Berry, Nicholas Degani, Michael Carowitz, and Nathan Leamer, describing one of the most significant industry ongoing paradigm changes – innovation IN the networks – and how the Commission's announced action in this docket supports that desirable change.

Mr. Rutkowski is a well-known engineering and legal expert in the field over the past 40 years who served in senior FCC positions from 1974 to 1986 and was likely the first FCC staff expert to consider the Commission's policy positions concerning the use of the TCP/IP protocol and the application of Title II regulation as explained in the article "The FCC is Taking the Right Step" and responsive to paras. 33, 35, et al. in the *Notice of Proposed Rulemaking*.

This letter is being filed electronically pursuant to Section 1.1206 of the Commission's rules. Please contact me if you have any questions.

Sincerely,

Antony M. Rutkowski
mailto: trutkowski@netmagic.com

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This is the Print View Page

« Back to Full View

# Innovation Today is IN the Network

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By **Anthony Rutkowski**

The largest and most important global information infrastructure today by any measure is clearly the global mobile network and all of its gateways, services, and connected devices. That network is standardized, managed, and energized by a combination of the 3GPP and GSMA. The level of 3GPP industry involvement and collaboration today probably exceeds all other telecom, internet, and assorted other bodies put together… and then some. Nowhere was this better demonstrated than the stunning 3GPP standards mega-meeting this past week in Reno — and the message was clear: innovation today is *in* the network.

There were 14 groups covering every segment of the global infrastructure meeting in parallel. Nearly 10,000 input contributions from 268 different companies and their subsidiaries (plus significant contributions from government agencies in China, Europe, and a few in the U.S.) were submitted. In a number of cases, companies have created a dozen different subsidiaries and sent people from all of them. There were a total of 2,756 people in Reno from basically every provider and vendor worldwide. As new network-based services and technologies like NFV and 5G scale globally, these groups now meet every 60-90 days at different locations around the world. Some groups are even holding "bis" and "ter" meetings in-between.

What is even more significant, however, are the new innovative platforms being instantiated in infrastructure, services, devices, and radio access networks. 3GPP is subdivided into three major divisions: SA (infrastructure and services), CT (edge/end-user devices), and RAN (radio access networks and gateways). SA had 2,096 inputs, CT — 990, and RAN, an amazing 6,827 inputs. The security group SA3, alone, had 411 input contributions. A virtual cornucopia (no pun intended) of new capabilities are being

baked into the network infrastructures and gateways that provide enhanced performance and security for end users, and greater resiliency overall to meet national and regional policy objectives.

An increasingly apparent observation from multiple technical, standards, industry, and legal/regulatory developments unfolding today is that a paradigm shift is underway towards "innovation in the network." Those 10,000 input documents into the 3GPP meetings last week and the FCC's removal of 19th-century NetNeutrality regulation are prominent bellwethers.

Even at the prominent university engineering schools, a new generation of professors are devising curricula and turning out a new generation of professionals and lots of published papers exclaiming that the innovation is *in* the network. In addition to all those contributions and new work items in the principal industry venue, 3GPP, vendors are also pushing new products into the provider marketplace as can be seen in the dramatic rise of network middlebox patents. Even a cursory search of Google, Google Patents, and Google Scholar produces stunning results of the trends.

Of course, NFV-SDN rollouts are all about the same thing. Part of that paradigm shift arguably involves a hard reality that it will be increasingly providers in the networks or at data centers orchestrating network capabilities. The NFV industry standards organization is today the second most active body, and it works closely with 3GPP. The nonsensical myth promulgated by self-serving internet religious that innovation only occurs at the "edges" is finally disappearing down the "alt-truth" rabbit-hole. The strange internet-centric world that came into fashion 20 years ago — especially prominent in Washington — is ending.

It is worth noting that a pendulum swing in network architectures has long been evident. Forty years ago, one of the real networking legends, Larry Roberts, would appear at closed government meetings hosted by MITRE with lots of charts and graphs portraying "Robert's Law." He argued that with a combination of network bandwidth metrics and computational metrics, you could predict cycles of network-centric supremacy and peripheral supremacy. The idea was aimed at U.S. government strategic technology analysts to adjust policies and investments accordingly. Larry at the time had just left DARPA and was ramping up Telenet Corporation in a Reston farm field to make it happen. His efforts were successful beyond anyone's wildest dreams — even if entire forests have disappeared in the region. Of course, with NFV-SDN and everything becoming virtualized, it is more complex if not impossible to do this. Nonetheless, the ebb and flow of these network technological architectures were described long ago.

Perhaps the most important takeaway is that innovation in the network is part of an evolutionary pattern where everyone gains, and government regulators should not be constraining that innovation by exercising authority to pick "architecture winners" based on self-serving myths. Net Neutrality is an oxymoron.

**By Anthony Rutkowski, Principal, Netmagic Associates LLC**

**Related topics:** Net Neutrality, Networks, Policy & Regulation, Telecom

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